

# Upper Pliocene Progradational (UP P1) Play

## *Buliminella* 1 biozone

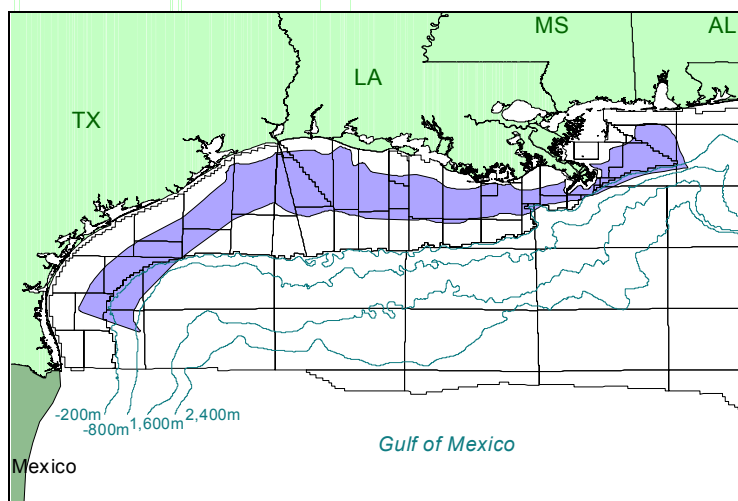


Figure 1. Play location.

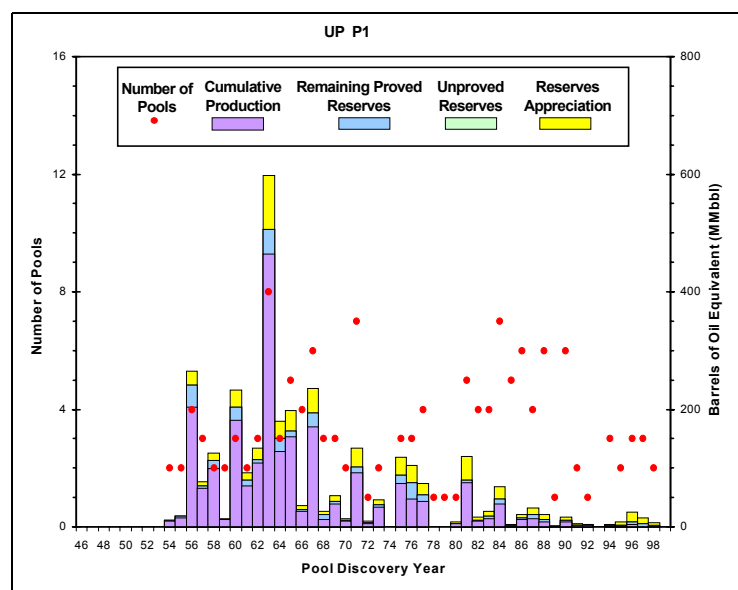


Figure 2. Exploration history graph showing reserves addition and number of pool discoveries by year.

UP P1 Play				
144 Pools 722 Sands	Minimum	Mean	Maximum	
Water depth (feet)	22	131	856	
Subsea depth (feet)	1115	8123	13703	
Number of sands per pool	1	5	33	
Porosity	23%	29%	36%	
Water saturation	16%	27%	49%	

Table 1. Pool attributes. Values are volume-weighted averages of individual reservoir attributes.

## Play Description

The established Upper Pliocene Progradational (UP P1) play has the fifth-most BOE cumulative production of any play in the Gulf of Mexico Region. The play occurs within the *Buliminella* 1 biozone and extends from the North Padre Island and Port Isabel Areas offshore Texas to the Destin Dome Area offshore Alabama (figure 1).

Updip, the play grades into the deposits of the Upper Pliocene Aggradational (UP A1) play. To the northeast and southwest, the UP P1 play is limited by a marked decrease of sediment influx at the edges of the UP depocenter. Downdip, the play grades into the deposits of the Upper Pliocene Fan 1 (UP F1) play.

The ancestral Mississippi River Delta System, located in the present-day offshore Louisiana and easternmost Texas areas, was the dominant depocenter during UP time. East of the Viosca Knoll Area and West of the Galveston Area, UP sediments thin at the edges of the depocenter.

The updip boundary of the lower Pliocene (LP) progradational deposits occurs either onshore or just slightly offshore. By UP time, the delta systems had migrated basinward so that the updip boundary of the progradational deposits is located primarily in Federal waters.

## Play Characteristics

Sediments in the UP P1 play represent major regressive episodes of outbuilding of both the shelf and the slope. Additionally, retrogradational, reworked sands with a thinning and backstepping log signature locally cap the play. Because these retrogradational sands are poorly developed and discontinuous, they are included as part of the UP P1 play.

Over one-third of the fields in

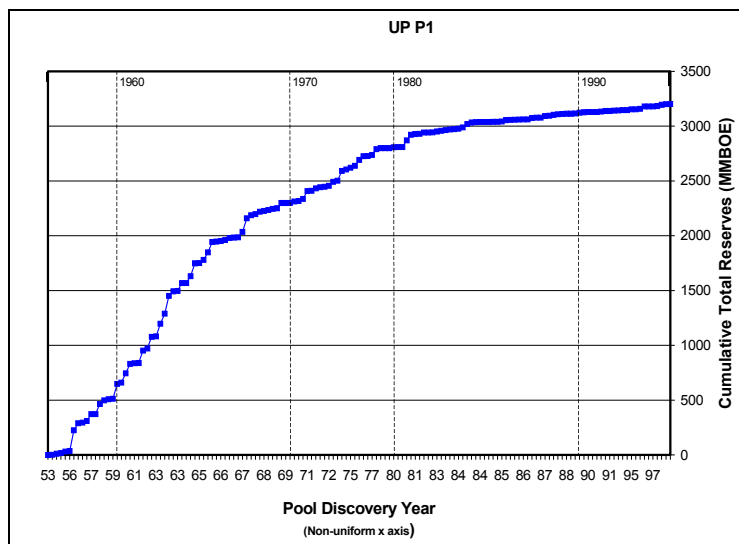


Figure 3. Plot of pools showing cumulative reserves by discovery order. Note the non-uniform x axis.

UP P1 Play Marginal Probability = 1.00	Number of Pools	Oil (Bbbl)	Gas (Tcf)	BOE (Bbbl)
<b>Reserves</b>				
Original proved	143	1.000	8.979	2.598
Cumulative production	—	0.868	7.864	2.267
Remaining proved	—	0.132	1.115	0.330
Unproved	1	<0.001	0.005	0.001
Appreciation (P & U)	—	0.207	2.229	0.603
<b>Undiscovered Conventionally Recoverable Resources</b>				
95th percentile	—	0.051	0.821	0.212
Mean	36	0.083	1.008	0.263
5th percentile	—	0.121	1.199	0.319
<b>Total Endowment</b>				
95th percentile	—	1.258	12.034	3.414
Mean	180	1.290	12.221	3.465
5th percentile	—	1.328	12.412	3.521

Table 2. Assessment results for reserves, undiscovered conventionally recoverable resources, and total endowment.

this play are structurally associated with salt diapirs with hydrocarbons trapped on diapir flanks or in sediments draped over diapir tops. Other fields are associated with normal faults, and growth fault anticlines. Some fields also contain hydrocarbon accumulations trapped by permeability barriers, updip pinchouts, or facies changes. Seals are provided by the juxtaposition of reservoir sands with shales and salt, either structurally (e.g., faulting, diapirism) or stratigraphically (e.g., lateral shale-outs, overlying shales).

## Discoveries

The UP P1 mixed gas and oil play contains total reserves of 1.207 Bbo and 11.213 Tcfg (3.202 BBOE), of which 0.868 Bbo and 7.864 Tcfg (2.267 BBOE) have been produced. The play contains 722 producible sands in 144 pools (table 1; refer to the Methodology section for a discussion of reservoirs, sands, and pools). The first reserves in the play were discovered in the South Timbalier 52 field in 1954 (figure 2). Maximum yearly total reserves of 597 MMBOE were added in 1963 with the discovery of eight pools. The largest pool in the play was discovered in 1956 in the South Timbalier 135 field with 189 MMBOE in total reserves (figures 2 and 3). Over 75 percent of the play's cumulative production and over 70 percent of the play's total reserves were from pools that were discovered in the 1960's or earlier. Ninety-nine percent of the play's cumulative production and ninety-seven percent of the play's total reserves are from pools discovered before 1990, reflecting the play's maturity. An average of about three pools was discovered each year from 1955 to 1998.

The 144 discovered pools contain 2,074 reservoirs, of which 1,022 are nonassociated gas, 877 are undersaturated oil, and 175 are saturated oil. Cumulative production has consisted of 62 percent gas and

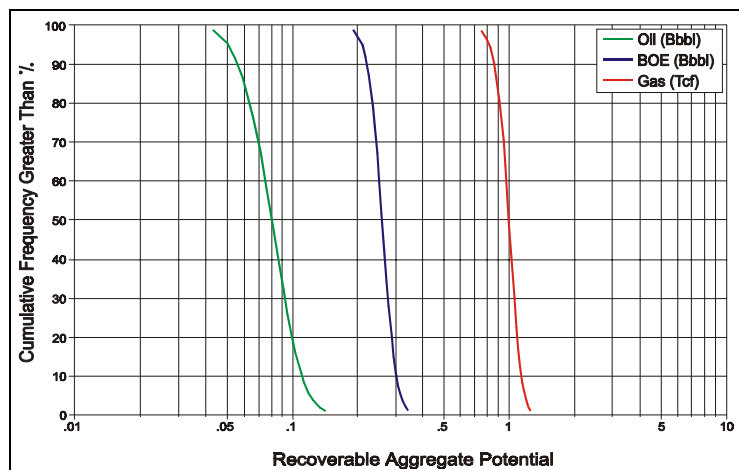


Figure 4. Cumulative probability distribution for undiscovered conventionally recoverable resources.

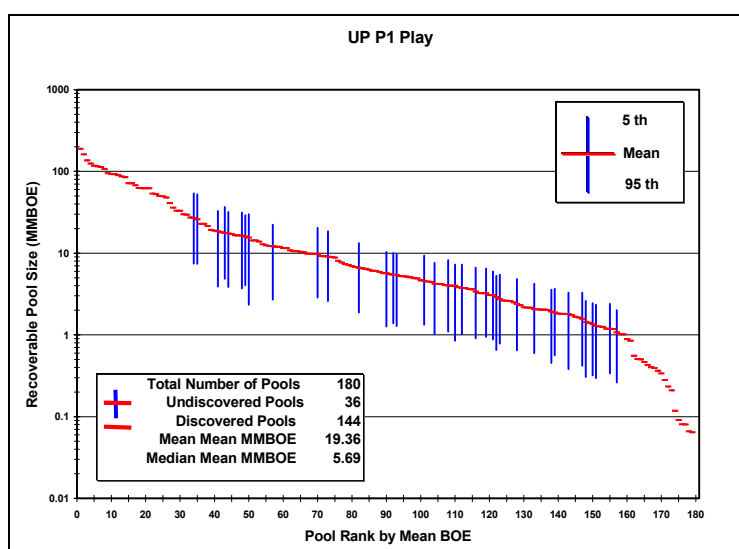


Figure 5. Pool rank plot showing the number of discovered pools (red lines) and the number of pools forecast as remaining to be discovered (blue bars).

38 percent oil.

## Assessment Results

The marginal probability of hydrocarbons for the UP P1 play is 1.00. The play contains a mean total endowment of 1.290 Bbo and 12.221 Tcfg (3.465 BBOE) (table 2). Sixty-five percent of this BOE mean total endowment has been produced.

Assessment results indicate that undiscovered conventionally recoverable resources (UCRR) have a range of 0.051 to 0.121 Bbo and 0.821 to 1.199 Tcfg at the 95th and 5th percentiles, respectively (figure 4). Mean UCRR are estimated at 0.083 Bbo and 1.008 Tcfg (0.263 BBOE). These undiscovered resources might occur in as many as 36 pools. The largest undiscovered pool, with a mean size of 27 MMBOE, is modeled as the 34th largest pool in the play (figure 5). The forecast places the next four largest undiscovered pools in positions 35, 41, 43, and 44 on the pool rank plot. For all the undiscovered pools in the UP P1 play, the mean mean size is 7 MMBOE, which is substantially smaller than the 22 MMBOE mean size of the discovered pools. The mean mean size for all pools, including both discovered and undiscovered, is 19 MMBOE.

The UP P1 is a super-mature play with BOE mean UCRR contributing only 7 percent to the UP P1 play's BOE mean total endowment. Limited exploration potential in this play exists in deep sections around salt structures where the UP P1 play may not be adequately tested.